DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE LOGISTICS COMMAND
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433-5001

16 JUN 1988

REPLY TO ATTN OF MMMA

SUBJECT Final Report--Air Logistics Early Requirements Technique (ALERT) Validation

TO See Distribution

1. In this report, we compared the FY87 ALERT model's BP15 Program Objective Memorandum (POM) predictions and other less sophisticated forecasting approaches to actual FY87 obligations. ALERT was more accurate than the other forecasting models. Indeed the ALERT forecasts for the total BP15 obligations were within two percent of the actual. We provided some suggestions for the continued enhancement of ALERT. We provide all of our conclusions and recommendations in Attachment 1.

2. Our point of contact is Rob Lucas or Larry Collins, HQ AFLC/MMMAA, AUTOVON 787-5249 or 787-5314.

FOR THE COMMANDER

Ronald D. Frederickson

RONALD FREDERICKSON
Acting Ch, Analysis & Information Mgt Div
DCS/Materiel Management

2 Atch
1. Conclusions and Recommendations
2. Final Report

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

1. In order to validate ALERT and continually improve ALERT, we should annually compare the ALERT POM projections against actual obligations for the first fiscal year of that program year's budget.

2. A comparison of the 1987 ALERT POM forecasts (developed in 1984) to actual 1987 obligations shows ALERT's total BP15 spares forecast was remarkably accurate (within 2 percent).

3. Although not statistically accurate, ALERT outperformed other "less sophisticated" forecasting models both by weapon system and by total BP15 spares requirement.

4. We need to expand the historical data base to include other variables to forecast the BP15 budget to reduce the forecast error and to explain (in a cause and effect manner) changes in requirements.

5. We need to examine other BP15 POM forecasting models (either in-house or contractor) in order to guarantee forecast model superiority and accuracy.

6. We need to analyze the accuracy and sensitivity of the age of the fleet and value of the fleet variables on the ALERT model forecasts.

RECOMMENDATIONS

1. Continue to use ALERT. (OPR: HQ AFLC/MMM)

2. repeat the validation effort for FY88 using ALERT POM projections from FY85. (OPR: HQ AFLC/MMMA)

3. Continue to refine the ALERT model by enhancing the input variables and the data base. (OPR: HQ AFLC/MMMA)

4. Continue to experiment with other BP15 POM forecasting approaches and validate their results against those of ALERT. (OPR: HQ AFLC/MMMA OCR: HQ AFLC/MMMI)

DEFENSE LOGISTICS AGENCY
DEFENSE TECHNICAL INFORMATION CENTER
CAMERON STATION
ALEXANDRIA, VIRGINIA 22304-6145

88/07/21

IN REPLY REFER TO DTIC-FDA

SUBJECT: Distribution Statement on Technical Reports

TO:

HQ AFLC/MMMAA
ATTN: MR. ROB LUCAS
WRIGHT PATTERSON AFB, OH 45433-5001

1. DTIC has received the report referenced below without an approved distribution statement.

2. All classified and unclassified reports, which are entered into DTIC's Technical Report Database, must have an approved distribution statement, but do not assign Statement A to classified reports. Distribution statements are required by DoD Directive 5230.24, Distribution Statements on Technical Documents, 18 Mar 87. Approved distribution statements are listed on the reverse of this letter. If you have any questions regarding these statements, call DTIC's Selection Section, (202) 274-6837, Autovon 284-6837.

3. Please indicate the proper distribution statement and return this form to the above address, ATTN: DTIC-FDAC. We request your reply within 20 working days. Delay in responding will result in denying availability of this report to qualified users.

FOR THE ADMINISTRATOR:

Richard A. Matthews

RICHARD A. MATTHEWS
Chief, Acquisition and
Selection Branch

SOURCE: (Prepared by) HQ AFLC/MMMAA, WRIGHT PATTERSON AFB, OH

TITLE: AIR LOGISTICS EARLY REQUIREMENTS TECHNIQUE (ALERT) VALIDATION

CONTRACT/GRANT NO: N/A

REPORT NO: FINAL REPORT DATE OF REPORT: 88/06/16

DTIC FL-182, Jan 88

file

DISTRIBUTION STATEMENT A:

APPROVED FOR PUBLIC RELEASE: DISTRIBUTION IS UNLIMITED

DISTRIBUTION STATEMENT B:

DISTRIBUTION AUTHORIZED TO U.S. GOVERNMENT AGENCIES ONLY; (Indicate Reason and Date Below). OTHER REQUESTS FOR THIS DOCUMENT SHALL BE REFERRED TO (Indicate Controlling DoD Office Below).

DISTRIBUTION STATEMENT C:

DISTRIBUTION AUTHORIZED TO U.S. GOVERNMENT AGENCIES AND THEIR CONTRACTORS; (Indicate Reason and Date Below). OTHER REQUESTS FOR THIS DOCUMENT SHALL BE REFERRED TO (Indicate Controlling DoD Office Below).

DISTRIBUTION STATEMENT D:

DISTRIBUTION AUTHORIZED TO DOD AND U.S. DOD CONTRACTORS ONLY; (Indicate Reason and Date Below). OTHER REQUESTS SHALL BE REFERRED TO (Indicate Controlling DoD Office Below).

DISTRIBUTION STATEMENT E:

DISTRIBUTION AUTHORIZED TO DOD COMPONENTS ONLY; (Indicate Reason and Date Below). OTHER REQUESTS SHALL BE REFERRED TO (Indicate Controlling DoD Office Below).

DISTRIBUTION STATEMENT F:

FURTHER DISSEMINATION ONLY AS DIRECTED BY (Indicate Controlling DoD Office and Date Below) or HIGHER DOD AUTHORITY.

DISTRIBUTION STATEMENT X:

DISTRIBUTION AUTHORIZED TO U.S. GOVERNMENT AGENCIES AND PRIVATE INDIVIDUALS OR ENTERPRISES ELIGIBLE TO OBTAIN EXPORT-CONTROLLED TECHNICAL DATA IN ACCORDANCE WITH DOD DIRECTIVE 5230.25, WITHHOLDING OF UNCLASSIFIED TECHNICAL DATA FROM PUBLIC DISCLOSURE, 6 Nov 1984 (Indicate date of determination). CONTROLLING DOD OFFICE IS (Indicate Controlling DoD Office).

The cited document has been reviewed by competent authority and the following distribution statement is hereby authorized.

Distribution Statement A
(Statement)

HQ AFLC/MMMA
(Controlling DoD Office Name)

(Reason)

WPAFB, OH 45433
(Controlling DoD Office Address City, State, Zip)

Bob Lucas
(Signature & Typed Name)

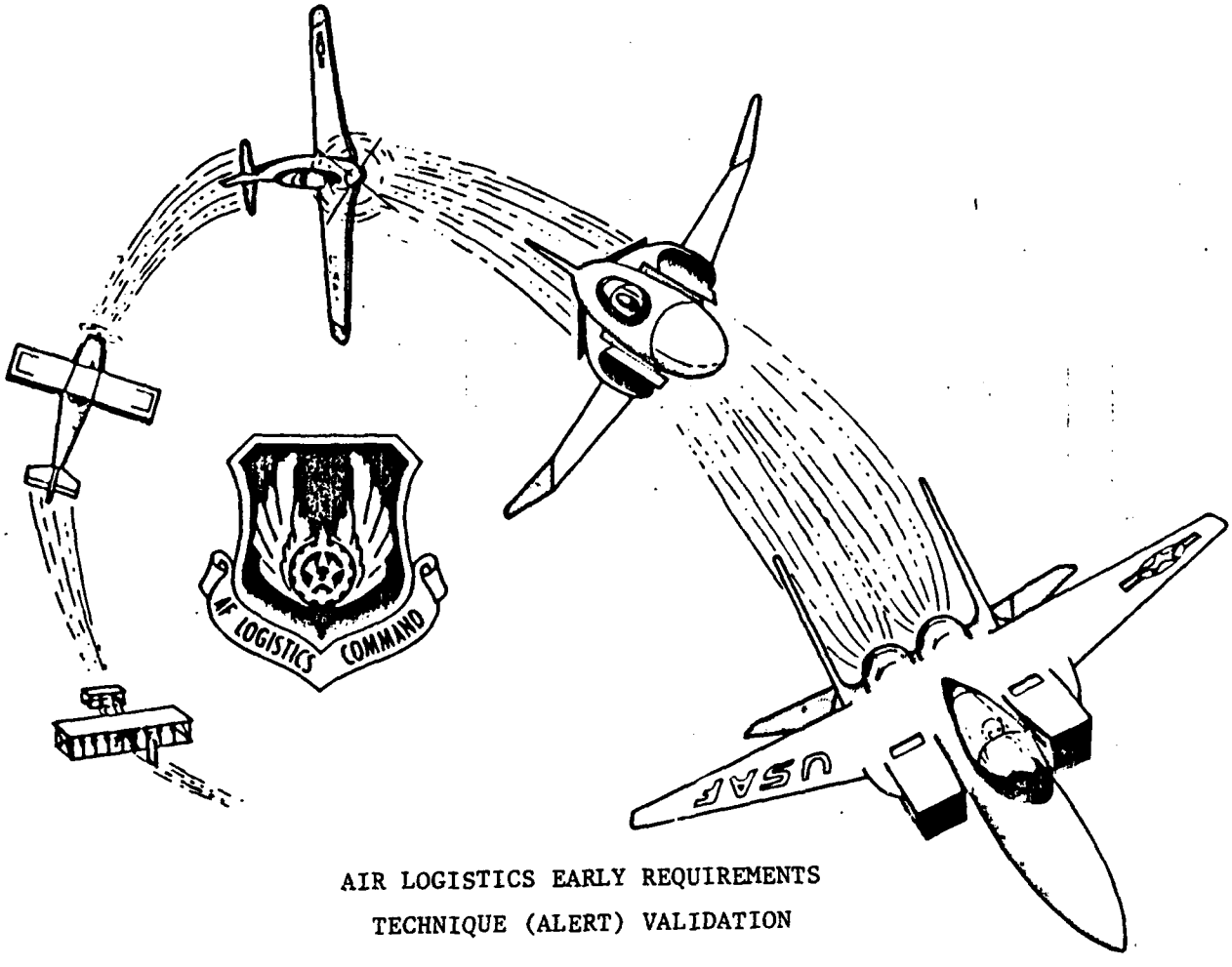
(Assigning Office)

27 Jul 88
(Date Statement Assigned)

(1)

AIR FORCE LOGISTICS COMMAND

MATERIEL ANALYSIS



AIR LOGISTICS EARLY REQUIREMENTS
TECHNIQUE (ALERT) VALIDATION

Adrienne Rexroad
Larry Collins

June 1988

ABSTRACT

This report documents an in-house validation of the Air Logistics Early Requirements Technique (ALERT), developed in 1983 by HQ AFLC/MMMA. ALERT has been used since fiscal year (FY) 1984 to baseline the Aircraft Replenishment Spares Budget (BP15) Program Objective Memorandum (POM) submission to HQ USAF. This report compares the ALERT model's POM forecasts for 1987 and other simple budget forecasting approaches to the actual FY87 first-year obligations for BP15 spares.

EXECUTIVE SUMMARY

For five years, Air Force Logistics Command (AFLC) has used ALERT as a tool to forecast the budget program 15 (BP15), aircraft spares Program Objective Memorandum (POM) peacetime operating stock requirement. ALERT is a regression-based model that uses historical budget data to develop budget estimates by weapon system. These individual forecasts are then aggregated into an overall BP15 POM forecast, for the first POM period past the budget projections (three years beyond the current fiscal year) and for the four subsequent POM years. The ALERT estimation process allows for a management review of the statistically forecasted values. In this report we compared ALERT's projections to other forecasting methods. We also compared ALERT's statistically derived results against ALERT's results after the management review. We found ALERT was more accurate than other less sophisticated forecasting approaches. Indeed ALERT's forecasts for FY87 were within 2 percent of the actual obligations for FY87. We propose continuing annual validation of ALERT forecasts and recommend other efforts to improve AFLC's ability to forecast BP15 POM requirements.

TABLE OF CONTENTS

CHAPTER I

THE PROBLEM

PROBLEM STATEMENT

The Air Logistics Early Requirement Technique (ALERT) has been accepted by the Air Force Logistics Command (AFLC) and the Air Staff as the long-range forecasting tool to forecast budget program 15 (BP15), aircraft replenishment spares requirements. Several early studies to determine the accuracy of ALERT forecasts were inconclusive, primarily due to a dearth of data and an inability to replicate the ALERT forecasting process for previous fiscal years. ALERT's approach was advertised as superior to other simple budget forecasting approaches. However, the model has never been clearly proven superior. We need to evaluate the accuracy and validity of ALERT to forecast budget requirements.

BACKGROUND

ALERT forecasts budget requirements for three to seven years out from the present. As ALERT was first used in FY84 to forecast the FY87 BP15 POM, this year was the first opportunity we had to validate the forecast against what was actually spent (obligated). We need to evaluate the accuracy and validity of ALERT to forecast future budget requirements. Using available data, we compared ALERT to actual requirements figures and to other "less sophisticated" forecasting approaches.

ALERT uses CSIS-generated budget requirements for three years beyond the present fiscal year, the reciprocal of age of the fleet, value of the fleet, and indicator variables which adjust for shifts in the data, against the actual budget dollars spent (or obligated) to arrive at POM forecast estimates. These estimates are generated by weapon system and aggregated to develop the total BP15 POM forecasts for four to nine years from the current fiscal year. The forecast development process has five basic steps: 1) to update and revise the previous year's ALERT data base, 2) to perform regression analysis on this data base, 3) to present statistically acceptable forecasts for management review, 4) to adjust forecasts, forecast equations, or forecast inputs as necessary, and 5) to present the ALERT weapon system-specific and aggregate forecasts. ALERT develops two set of forecasts. The ALERT "unscrubbed" results reflect steps one through three and are based on straight regression. The second set of forecasts, the "scrubbed" results, reflect the necessary adjustments required due to updated data or known future events which might impact the forecasted requirement (for example newly approved support for a major modification).

OBJECTIVES

1. Compare ALERT forecasts for FY87 (generated in 1984) to actual BP15 FY87 obligations.

2. Compare ALERT forecasts to other simple forecasting methods.

3. Identify possible improvements to ALERT.

CHAPTER 2

ANALYSIS

We document our analysis in three sections. In the first section, we describe our approach, including a description of the four forecasting approaches we compared. The four forecasting approaches are cost per flying hour (CPFH), inflation growth, unscrubbed ALERT, and scrubbed ALERT. In the second section, we compare the results of the four approaches to actual obligations. Finally, we describe issues and what actions we should take to improve future POM forecasts.

APPROACH

We compared four forecasting approaches. The ALERT forecast plus three other possible forecasting approaches which could be easily used to project the BP15 POM. The criteria for determining the nature of these approaches were 1) availability of data to support the POM forecasting approach, 2) ease of use by budget program managers, 3) "common sense" selection of variables which would be expected to affect the BP15 POM forecasts. The validation exercise involved comparing the following forecast methods to the final ALERT results: the cost per flying hour (CPFH) method (which was used for actual POM estimation before FY82), a forecast method based upon projected inflation rates, and the "pure" ALERT regression analysis method (i.e., the one without a management scrub). Both the cost per flying hour and the projected inflation rates have been used in the past to forecast POM requirements.

Table 2-1 shows the basic data used in our analysis.

BASIC INPUT DATA

Weapon System	FY84 Obligations (IN $M)	FY87 Obligations (IN $M)	1984 Flying Hours (IN 000s)	1987 Flying Hours IN 000s)
A-7	28.4	16.6	73.0	73.0
A-10	101.1	46.5	222.2	227.2
B-52	136.2	39.2	102.5	108.1
C-5	97.0	128.5	58.1	66.1
C-130	93.1	69.8	378.6	386.8
C-135	54.5	89.8	262.3	300.2
C-141	43.9	66.7	149.5	292.1
E-3	66.0	47.5	30.1	36.6
F-4	181.2	72.4	350.1	332.8
F-15	182.8	194.4	175.7	216.5
F-16	77.0	146.6	186.0	294.7
F-111	395.3	301.6	79.0	93.2
F-100	285.4	625.8	351.2	433.0
COMMON	479.9	330.4		
OTHER	173.6	154.7		
TOTAL	2395.4	2330.3	2562.6	2860.3

TABLE 2-1

Inflation Growth

The second approach used for the validation of ALERT applies the 1984 inflation factor for 1987 dollars, which was 1.128. The 1984 obligated dollars were multiplied by 1.128 across all weapon systems (including "Common" and "Other" categories) to arrive at an estimate of the 1987 POM submission.

INFLATION GROWTH FORECAST

WEAPON SYSTEM	FY84 OBLIGATIONS (IN $M)	PROJECTED FY87 OBLIGATIONS (FY84 $ * 1.128)
A-7	28.4	32.0
A-10	101.1	114.0
B-52	136.2	153.6
C-5	97.0	109.4
C-130	93.1	105.0
C-135	54.5	61.5
C-141	43.9	49.5
E-3	66.0	74.4
F-4	181.2	204.4
F-15	182.8	206.2
F-16	77.0	86.9
F-111	395.3	445.9
F-100	285.4	321.9
COMMON	479.9	541.3
OTHER	173.6	195.8
TOTAL	2395.4	2702.0

TABLE 2-3

ALERT "Unscrubbed" Results

This forecasting approach is presented to assess the impact of the ALERT "management scrub" upon the accuracy of the forecast. These values were selected from the final approved regression equations used to baseline the ALERT submission immediately before the management scrub took place [ALERT project report, MMMA unpublished draft].

ALERT UNSCRUBBED FORECAST

WEAPON SYSTEM	ALERT UNSCRUBBED RESULTS
A-7	12.7
A-10	48.0
B-52	185.3
C-5	45.2
C-130	90.5
C-135	70.4
C-141	54.0
E-3	45.0
F-4	146.8
F-15	137.5
F-16	418.2
F-111	291.1
F-100	401.4
COMMON	322.3
OTHER	211.0
TOTAL	2479.4

TABLE 2-4

ALERT Final Results

Before submission to the Air Staff, the ALERT forecasts undergo the revision process. This "management scrub" is necessary because there are some problems with the ALERT data base used to develop the forecasts. First, the data base has a limited number of variables, two of which (the age of the fleet, value of the fleet) are computed by SAF/ACCE. HQ AFLC/MMMI does not agree with the method used to develop the value of the fleet estimates, nor that these variables accurately predict future requirements. They point out the value of the fleet does not decrease as fast as the computed value does, in fact they claim it doesn't decrease at all for selected weapon systems. As a result of the current method to compute the value of the fleet, the requirement may be underestimated. Secondly, the ALERT data base should be expanded to include more possible variables which impact the BP15 POM. One of the weaknesses of ALERT is although the variables have a relatively high statistical correlation, they do not have a logical cause-effect relationship. As a result, the current ALERT variables do not provide a complete "intuitive" interpretation of why past relationships exist. Thirdly, the "management scrub" can adjust for the effect of a non-programmatic and non-statistical decisions upon the budget and item requirements. The quantitative effects of these decisions cannot be accurately portrayed in the ALERT model or any other strictly quantitative model.

ALERT SCRUBBED FORECAST

WEAPON SYSTEM	ALERT SCRUBBED RESULTS
A-7	12.7
A-10	42.2
B-52	148.2
C-5	74.6
C-130	78.7
C-135	62.0
C-141	47.5
E-3	50.5
F-4	118.9
F-15	126.5
F-16	372.2
F-111	238.7
F-100	393.4
COMMON	322.3
OTHER	189.1
TOTAL	2277.5

TABLE 2-5

Comparison Results

In this section we compare the FY87 forecasts for the four forecast approaches to the actual PY87 first year (FY87) close-out obligated dollars. Table 2-6 shows the forecasts for all four forecasting methods and the actual obligations. Then Table 2-7 shows the forecast errors by type of forecast approach for all four methods above to use FY84 information to project the PY87/FY87 BP15 budget.

COMPARISON OF THE
FOUR APPROACHES
($ Millions)

Weapon System	Cost Per Flying hour	Inflation Growth	Alert Unscrubbed Estimates	Alert Final Estimates	BP15 FY87/PY87 Obligations
A-7	28.4	32.0	12.7	12.7	16.6
A-10	103.4	114.0	48.0	42.2	46.5
B-52	143.6	153.6	185.3	148.2	39.0
C-5	110.4	109.4	45.2	74.6	128.5
C-130	95.1	105.0	90.5	78.7	69.8
C-135	62.4	61.5	70.4	62.0	89.8
C-141	43.6	49.5	54.0	47.5	66.7
E-3	80.3	74.5	45.0	50.5	47.5
F-4	172.2	204.4	146.8	118.9	72.4
F-15	225.2	206.2	137.5	126.5	194.4
F-16	122.0	86.9	418.2	372.2	146.6
F-111	466.4	445.9	291.1	238.7	301.6
F-100	351.9	321.9	401.4	393.4	625.8
COMMON	*	541.3	322.3	322.3	330.4
OTHER	*	195.8	211.0	189.1	154.7
TOTAL	2004.9	2702.0	2479.4	2277.5	2330.3

* Estimates for these categories included in the major weapon system estimates.

TABLE 2-6

FORECAST ERRORS FOR THE
FOUR APPROACHES

Weapon System	Cost Per Flying Hour Forecast Error	Inflation Growth Forecast Error	Unscrubbed Alert Forecast Error	Scrubbed Alert Forecast Error
A-7	11.8	15.4	3.9	3.9
A-10	56.9	67.5	1.5	4.3
B-52	104.6	114.6	146.3	109.2
C-5	18.1	19.1	83.3	53.9
C-130	25.3	35.2	20.7	8.9
C-135	27.4	28.3	19.4	27.8
C-141	23.0	17.2	12.7	19.2
E-3	32.8	267.0	2.5	3.0
F-4	99.8	132.0	74.4	46.5
F-15	30.8	11.8	56.9	67.9
F-16	24.6	59.7	271.6	225.6
F-111	164.8	144.3	10.5	62.9
F-100	273.9	303.9	224.4	232.4
COMMON	330.4	210.9	8.1	8.1
OTHER	154.7	41.1	56.3	34.4
TOTAL BP15 POM	325.4	371.7	149.1	52.8
TOTAL ERROR	1704.5	1599.8	1141.6	960.8

TABLE 2-7

Despite its weaknesses, ALERT is a more accurate predictor than the other simple forecasting approaches. For 12 (9 weapon systems, common and other, and the total BP15 POM) of the 16 forecasts, ALERT (unscrubbed or scrubbed) provided more accurate forecasts. Note scrubbed ALERT's total BP15 POM requirement was within 2 percent (52.8/2330.3) of the actual obligation for program year (PY) 1987 and fiscal year (FY) 1987. By PY87/FY87 we mean 1987 three-year program money obligated in 1987. Also note the ALERT scrubbed values were generally as accurate as the unscrubbed values except for the total BP15 POM which was much more accurate.

Although ALERT was more accurate, we wanted to see if ALERT provided statistically valid results.

To compare among the limited number of observations, we used a non-parametric test called the chi-square test:

$$\text{Chi-square} = \frac{\text{Observed Value} - \text{Expected Value}}{\text{Observed Value}}$$

For this comparison, we considered the "observed value" to be equal to the obligated dollars for PY87 at the close-out of FY87. The "expected" or forecast value changed depending upon which forecast approach was used. The forecasted values for each weapon system and the total budget were considered as "expected values." We can consider the forecasts to be valid if the chi-square comparison between the forecasted POM and actual obligations is smaller than the chi-square standard (or critical) value of 7.261. The chi-square test is reliable for small samples, which makes it valuable in this case, where we have 15 weapon systems and a total line from which to validate the forecasts. Below are the total chi-square values for each of the forecast approaches presented above.

CHI-SQUARE TOTALS FOR
THE FOUR APPROACHES

COST PER FLYING HOUR APPROACH CHI-SQUARE	INFLATION GROWTH APPROACH CHI-SQUARE	UNSCRUBBED ALERT CHI-SQUARE	SCRUBBED ALERT CHI-SQUARE
1251.11	1126.53	1314.47	853.16

TABLE 2-7

Table 2-7 indicates that none of the forecasting approaches are statistically close to the actual obligated dollars for PY87/FY87. Table 2-6 shows that a large part of the forecast errors are attributable to three weapon systems: the B-52, the F-16, and the F-100, all of which are undergoing constant change and/or growth. These systems were undergoing considerable program volatility, either through expansion of the fleet (F-16, F-100) or through modifications (B-52). Accurate POM forecasts for these systems is particularly difficult. Table 2-8 shows that the chi-square values for the forecasts would be significantly reduced if these three systems were not considered.

CHI-SQUARE TOTALS WITHOUT F-16, F-100, AND B-52

FLYING HOUR APPROACH CHI-SQUARE	INFLATION APPROACH CHI-SQUARE	UNSCRUBBED ALERT CHI-SQUARE	ALERT USED FOR BP15 POM CHI-SQUARE
846.32	617.68	182.01	113.93

TABLE 2-8

The statistics show there is still room for improvement; however, a 2 percent overall error is really remarkable for a long-range forecast. Of course there is no guarantee this accuracy will continue in the future; after all this is only one data point. We suggest this analysis be repeated yearly to continue to measure ALERT's validity.

ISSUES

Earlier in this report, we addressed some of the issues with ALERT. In this section we highlight all the issues, discuss their impact and propose future analysis to resolve the issues.

1. Although ALERT uses regression and uses variables that are highly correlated to requirements in a statistical since, there doesn't appear to be any cause and effect relationship between the variables. Optimally, a forecasting model could be used to predict the impact of policy decisions on requirements. ALERT does not do that. For example, one can build a statistically reliable regression model that shows the number of drunks in a town is directly related to the number of churches. However, one cannot conclude that if you reduce the number of churches in a town, the number of drunks will decrease. We should conduct analysis to see if ALERT should include variables like actual flying hours, type of mission, and the expected occurrence of a major modification to predict cause and effect relationships.

2. Further analysis is needed to determine the sensitivity of the age of the fleet and value of the fleet on future requirements. The current formulas to compute the value of the fleet tends to depreciate the fleet value, and hence reduce future requirements, too quickly.

3. We need to validate ALERT annually. If there are significant errors in the forecast, we need to identify the cause of the errors and ensure we develop a "fix" for future forecasts.

4. There are a number of other models that forecast BP15 requirements, such as the Peacetime Operating Spares Support Estimating Model (POSSEM), the Air Force Spares Estimating Model (AFSEM), and MACROSTRAT. In addition, the RAND Corporation is beginning a study, "Enhancing the Logistics Requirements Estimation Process." The objective of RAND's project is to develop and assess alternative ways to forecast spares requirements. We should compare the performance of these models to ALERT to either replace ALERT or identify possible improvements to ALERT.

5. Currently ALERT forecasts requirements by weapon system. Perhaps improved results could result from forecasting requirements by commodity groupings. For example, electronic component prices tend to decline as new technology is developed. Perhaps a different regression equation for electronic spares would be more accurate. This would require a significant data base like the one envisioned in the Requirements Data Bank Strategic Data Base [1]. Some analysis is needed to determine the feasibility and accuracy of using commodity groupings or some other aggregation of the data. Then if feasible, a data base must be built.

CHAPTER 3

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

1. In order to validate ALERT and continually improve ALERT, we should annually compare the ALERT POM projections against actual obligations for the first fiscal year of that program year's budget.

2. A comparison of the 1987 ALERT POM forecasts (developed in 1984) to actual 1987 obligations shows ALERT's total BP15 spares forecast was remarkably accurate (within 2 percent).

3. Although not statistically accurate, ALERT outperformed other "less sophisticated" forecasting models both by weapon system and by total BP15 spares requirement.

4. We need to expand the historical data base to include other variables to forecast the BP15 budget to reduce the forecast error and to explain (in a cause and effect manner) changes in requirements.

5. We need to examine other BP15 POM forecasting models (either in-house or contractor) in order to guarantee forecast model superiority and accuracy.

6. We need to analyze the accuracy and sensitivity of the age of the fleet and value of the fleet variables on the ALERT model forecasts.

RECOMMENDATIONS

1. Continue to use ALERT. (OPR: HQ AFLC/MMM)

2. Repeat the validation effort for FY88 using ALERT POM projections from FY85. (OPR: HQ AFLC/MMMA)

3. Continue to refine the ALERT model by enhancing the input variables and the data base. (OPR: HQ AFLC/MMMA OCR: HQ AFLC/MMMI)

4. Continue to experiment with other BP15 POM forecasting approaches and validate their results against those of ALERT. (OPR: HQ AFLC/MMMA OCR: HQ AFLC/MMMI)

REFERENCES

1. Brannock, James W., Lt Timothy J. Sakulich, Lt Richard Horcin, Lawrence Collins, Robbin Lucas, Robert Appelbaum, and Adrienne Rexroad, *POM Forecasting*, MMMAA *study* #85-318, 27 June 86

END

DATE

FILMED

DTIC

10-88